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ABSTRACT

The study, involving 15 nonhandicapped and 15 handicapped infants, investigated parental estimates of infant developmental functioning as a function of parental attitudes. Examined was the relationship between source of evaluation (mother, father, diagnostician), infant temperament category, and factors of maternal attitude (such as appropriate vs. inappropriate control of child's aggression). Among findings were that all three sources of evaluation agreed on the relative order of infants by mental age; the childrearing attitudes of mothers of handicapped infants were more inappropriate than the attitudes of mothers of nonhandicapped children; the maternal and paternal reports of all Ss' capabilities yielded significant underestimation of infants' mental ages when compared to diagnostic evaluation; and that infant temperament did not differentially influence parental perceptions of competencies. (SW)

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A COMPARISON OF MATERNAL, PATERNAL AND DIAGNOSTIC EVALUATIONS OF TYPICAL AND ATYPICAL INFANTS*

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A Comparison of Maternal, Paternal, and Diagnostic Evaluations of Typical and Atypical Infants

Barbara Donnelly, Jane Doherty, Robert Sheehan, & Charles Whittemore

With the advent of PL94-142, the fields of early childhood and special education have placed increasing emphasis on evaluation of handicapped children by multidisciplinary teams. The gathering of information across contexts and from multiple informed sources has been recognized as a means of improving both the diagnostic process and educational planning (Cross, 1977; DuBose, Langley & Stagg, 1977; Frankel, 1978; Honzik, 1976; Simonsson, Huntington & Parse, 1980). Sources for this information have expanded to include teachers and parents of handicapped children in addition to the traditional medical, psychological and other health-related professionals. Parental involvement has been stressed, in particular, as an important source of clinical information that may enhance the diagnostic value of information gleaned from standardized measures (Honzik, 1976; Wolfensberger & Kurtz, 1971). Moreover, information regarding parent's perceptions of, and expectation for, the development of their handicapped children is necessary for assisting them in providing experiences appropriate to their children's level of development (Swanson & Kire, 1978; Hunt & Paraskevopoulos, 1980).

Since at least the 1950's, clinicians have used parental estimates of their children's level of developmental functioning as a "springboard" for discussing the results of psychometric testing (Schulman & Stern, 1959) or as a means of assessing parental understanding of their children's difficulties (Ewert & Green, 1957). Unfortunately, however, these clinical observations often led to stereo-typical generalizations that parents of retarded children are unrealistic and deny their children's retardation (Woltensberger & Kurtz, 1971). As we shall see, results of empirical studies on the accuracy of parental perceptions generally have not been interpreted as supportive of these generalizations.

Studies assessing the accuracy of parental estimates of their children's developmental functioning have typically used the results

of diagnostic evaluation as the standard of comparison. Hence, parental estimates were accurate if they agreed with diagnosticians' scores or were inaccurate if they greatly under- or over- estimated diagnosticians' scores.

Two different methods have been used to obtain parental estimates of developmental functioning. The first consists of asking parents to give the age-level at which they believe their children to be functioning intellectually, regardless of their actual chronological age. This figure is used as a Mental Age to convert to a ratio IQ or DQ. The resulting IQ/DQ is then treated as the parental estimate for comparison to an IQ or DQ derived from diagnostic assessment. Using this method, correlations between the estimates of mothers or parents of preschool and older retarded children have ranged from a low of .50 (Heriot & Schmickel, 1967) to a high of .83 (Matheny, 1966 as cited by Heriot & Schmickel, 1967). Intermediate values of .55 (Ewert & Green, 1957), .62 (Wolfensberger & Kurtz, 1971), .67 (Schulman & Stern, 1959) and .74 (Kurtz, 1965) have also been reported. Although not unanimous in their opinion, researchers typically have interpreted these findings as sufficient parental-diagnostician agreement to discredit the clinical notion that parents of retarded children are unrealistic. However, parents in these studies did tend to overestimate their children's capabilities, as evidenced by reports of differences between the means for parental and diagnostic scores. These differences have ranged from 1.7 to 8.6 IQ points. But, even in cases of statistical significance, most investigators regarded these differences as too small to be practically meaningful or evidence of distorted, unrealistic parental perceptions.

A second, more refined methodology has also been used to study parental accuracy of perception. Instead of estimating the age of current functioning, parents are given a set of items either from a standardized test or a rating questionnaire, and are asked to indicate their children's performance. Parental and diagnostician item responses or derived scores are then compared. This method affords a better test of parental accuracy than did the first method, because it taps parents' perception of the very same behaviors evaluated by diagnosticians.

Results of studies using this methodology have corroborated those of studies using the first methodology. Groups of mothers or mothers plus fathers were found to overestimate their young childrens' Stanford-Binet performance by an average of 4 to 7 IQ points (Gorelick & Sandhu, 1967; Johnson & Capobianco, 1957 as cited by Capobianco & Knox, 1964). Separate comparisons of maternal and paternal scores to those of a diagnostician were reported in yet another study (Capobianco & Knox, 1964). Mothers overestimated their children's Binet performance by an average of 6.7 IQ points, whereas fathers did not over- or under- estimate their children's performance. No other study to date has examined the accuracy of paternal estimates of their children's current functioning, although one study has reported that mothers and fathers of retarded, cerebral palsied children were alike in overestimating the competencies their children were predicted to attain at maturity (Jensen & Kogan, 1962). Hence, we still know relatively little about the accuracy of paternal perceptions.

We also know relatively little about either maternal or paternal accuracy of perception regarding the developmental functioning of handicapped infants or nonhandicapped children at any age. Such information is needed to determine whether or not the tendency toward slight overestimation is limited only to parents of handicapped children, and if so, if it is further limited to a particular age range.

Only one study has investigated maternal perceptions of nonhandicapped children and these were of preschool age. Using responses to items on the Binet and PPVT, Hunt & Paraskevopoulos (1980) found only a moderate correlation of .53 between the number of correct responses predicted by mothers and those actually obtained. This stands in contrast to a much larger correlation of .83 reported by Gradel, Thompson & Sheehan (1981) for mothers of retarded preschoolers and a diagnostician, based on scores from the McCarthy Scales.

Similarly, only one study has investigated the accuracy of maternal perceptions of handicapped infants. Gradel et al. (1981) reported an impressive correlation of .84 between developmental

age equivalents derived from maternal responses to the Modified Bayley Interview (Gradel, 1979) and those derived from diagnostic evaluations using the Bayley Scales of Infant Development (Bayley, 1969). As in prior studies, mothers of these atypical children tended to overestimate more than underestimate their infants' developmental capabilities.

In sum then, the literature has indicated that mothers of handicapped preschoolers and older children tend to overestimate their children's capabilities while still achieving moderate to high correlations with diagnostic evaluations. However, no studies have directly compared maternal estimates of nonhandicapped, or what we will call typical, infants with maternal estimates of handicapped or atypical infants, thereby controlling for the instrument and age of children employed. However, no studies have compared maternal and paternal accuracy of perceptions for infants, whether typical or atypical. In this study, therefore, both maternal and paternal reports for typical and atypical infants on the Modified Bayley Interview were compared to diagnostic evaluations of infants on the Bayley Scale of Mental Development.

A second factor, that of infant temperament, was also taken into consideration in this study. Based on Cameron's (1978) suggestion that infant temperament may be a mediating variable in infant behavioral assessment, the possibility that perception of developmental capabilities might be influenced by the easy or difficult nature of the infant was investigated. Although maternal ratings of temperament have been reported for atypical infants (Blacher-Dixon & Simeonsson, 1981), no date relating temperament to estimates of developmental functioning have been reported thus far. Hence, in this study maternal and paternal agreement with diagnostic evaluations was examined as a function of infant temperament category.

A third problem of interest was maternal attitude. The research indicates that parental attitudes can have a major influence on infant development (Bromwich, 1979). Hence, the identification of those parental attitudes which foster development should be goals of parent-infant research (Bromwich, 1979).

According to Bromwich (1979), a considerable body of research has supported the following propositions:

1. Infant-parent interaction is a truly reciprocal process: the behavior of each affects the other's response.
2. The prime requisite for the infant's optimum development is a mutually satisfying relationship between parent and infant.
3. The parent gains competence as she enjoys her baby's increasing responsiveness to her successful effort in motivating the infant's growth-promoting activities. (pp.6-7)

These propositions by Bromwich (1979) which indicate infant-parent interaction, mutually satisfying relationships, and parental competence are also part of the childrearing maternal attitude factors found on Cohler's Maternal Attitude Scale (1977). Items for this instrument are based largely on Sander's (1962, 1964, 1969) formulation of the developing mother-child relationship.

Mothers' attitudes toward childrearing have been referred to in the literature as: sensitivity to infant cues (Leavitt & Donovan, 1979); parent temperament (Scholom, Zucker, & Stollak, 1979); and maternal perception of infants (Kronstadt, Oberklaid, Ferb, & Swartz 1979). Researchers have studied how childcare attitudes of mothers relate to development of young children of mentally ill and well mothers (Cohler, Gallant, Grunebaum, & Weiss, 1980), and how childcare attitudes relate to two generations of mothers (Cohler, Grunebaum, Weiss, & Moran, 1971). However, there is no research relating maternal attitudes to estimates of developmental functioning of infants. Hence, in this study maternal estimates of infant developmental functioning were examined as a function of maternal attitude.

Method

Subjects

Subjects were 15 typical and 15 atypical infants ranging in age from 7 to 21 months. Each group comprised 8 males and 7 females. Infants were selected from a larger volunteer pool of Caucasian infants, aged 6 to 24 months, from intact families residing in the Calumet Region of Indiana. The atypical infants

were enrolled in a program for multiply handicapped infants at a regional rehabilitation center. Although these infants were classified as developmentally delayed, their handicaps included: Down's Syndrome, Cerebral Palsy, seizures, and brain damage. Atypical infants (M = 19.0; SD = 5.20) were significantly older than typical infants (M = 14.0; SD = 4.73), F (1,28) = 6.43; $p. < .02$, but the groups did not differ significantly in birth order.

Mothers of typical infants and mothers of atypical infants did not differ significantly in age (M = 29.07 vs. M = 29.67) or in years of education (M = 15.2 vs. M = 14.0). Similarly, fathers of typical infants and fathers of atypical infants did not differ significantly in age (M = 31.47 vs. M = 31.40) or in years of education (M = 16.2 vs. M = 15.3).

Design

A 2 (type of child) X 3 (source of evaluation) factorial design was used in this study. Levels of the first factor (type) were typical and atypical infants. Levels of the second factor (source) were mothers, fathers, and diagnostician.

Independent variables included: source of evaluation (mother, father, and diagnostician), infant temperament category (easy, intermediate-low, intermediate-high, or difficult), and the factors of maternal attitude. These maternal attitude factors included: appropriate versus inappropriate control of child's aggression; encouragement versus discouragement of reciprocity; appropriate versus denial of emotional complexity in childcare; and feeling of competence versus lack of competence in perceiving and meeting the baby's needs. These factors combine to elicit adaptive maternal attitudes versus maladaptive maternal attitudes toward childrearing.

The dependent variable in this study was infant mental age. This score was obtained from the Baley Scales of Infant Development (Bayley, 1969) or the Modified Bayley Interview (Gradel, 1979). See Table 2 for a schema of variables.

Cohler. Maternal attitude data were obtained from each child's mother using the Maternal Attitude Scale (Cohler, 1977).

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Table 2

Schema of Research Variables

Measures	Variables		
	Dependent	Independent	Sample
Bayley Scales of Infant Development	Infant Mental Age	Source: Diagnostician	
Modified Bayley Interview	Infant Mental Age Infant Mental Age	Source: Mother Source: Father	
Cary Infant Temperament		Temperament Category: Easy Intermediate-low Intermediate-high Difficult	
Cohler Maternal Attitude		Adaptive vs. maladaptive maternal attitude (on 5 factors)	
Family Data Questionnaire			Infant Chronological Age Birth Order Mother Chronological Age Father Chronological age Mother Education Father Education

Measures

Bayley. Diagnostic child performance data were collected on the Mental Scale of the Bayley Scales of Infant Development (Bayley, 1969). Raw scores from the Mental Scale were converted to age equivalent scores called "mental ages" (MA). Bayley (1969) indicated this score may be "a more direct estimate of effective level of functioning" for exceptional children. MAs can range from 1 to 30 months. Conversion of raw scores into standard scores or Mental Develpmental Indexes was deemed inappropriate because both floor and ceiling effects were obtained. Atypical infants often scored below the lowest index of 49, whereas typical infants often scored above the highest index of 150.

The Bayley was modified into an interview instrument by simplifying the vocabulary, converting it into a question format, and incorporating a demonstration of each item (Gradel, 1979). The Modified Bayley Interview was used to obtain mother and father estimates of development. Mental age (MA) scores were derived from norms for raw scores given in the manual for the Bayley Scales of Infant Development (Bayley, 1969).

Carey. Infant temperament data were obtained from each child's mother using the Carey Temperament Questionnaire (Carey, 1977, 1978). Mothers were asked to rate their child's most 'recent and current behaviors" on a Likert scale ranging from 1 (almost never) to 6 (almost always). The statements rated by the mothers allowed them to describe their child in terms of nine dimensions: activity, rhythm, approach/withdrawl, adaptive, intensity, mood, distractability, and threshold. Scores from a diagnostic cluster of five of these dimensions were used to obtain a category score for each infant: easy, intermediate low, intermediate high, or difficult. These conversions were computed using the directions on the Carey Temperament Scale (Carey, 1977, 1978).

Cohler. Maternal attitude data were obtained from each child's mother using the Maternal Attitude Scale (Cohler, 1977). Mothers were asked to rate their degree of agreement or disagreement for each statement on a Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). The statements rated by the mother allowed them to describe maternal attitude in terms of these maternal atti-

Table 1

Schematic Description of Child-rearing Attitude Factors: Maternal Attitude Scale*

	Factor	Adaptive Attitude	Maladaptive Attitude
(I)	Appropriate versus inappropriate control of child's aggression.* Sample item: good mothers keep a tight hold on their child's expression of angry feelings.	Intent of aggressive impulse should be recognized but it is important to modulate expression of aggression by providing alternate channels.	Overly restrictive attitudes or, less commonly, overly permissive.
(II)	Encouragement versus discouragement of reciprocity.* Sample item: a mother and her five-month-old baby should be able to understand each other fairly well.	Babies can communicate with their mothers and mothers should encourage development of a relationship between mother and child.	Babies cannot communicate with their mothers and are unable to develop a reciprocal social relationship or to respond to appropriate cues from their mothers.
(III)	Appropriate versus inappropriate closeness with the child. Sample item: a one-year-old child doesn't feel his mother is "with him" if she is doing other things at the same time.	A mother can enjoy and care for a baby without sacrificing herself, without becoming overly binding or overly protective, and without yielding to the baby's demand for an exclusive relationship (Mahler et al., 1975).	Pregnancy, delivery and child care are seen as burdensome, depleting, and destructive of self, vacillation between the wish to be the sole caretaker, and perpetuate the mother-infant symbiosis, and the wish to relegate all aspects of child care to others, a pattern similar to that described by Levy (1943) as the "overprotective mother."

Table 1 (continued)

Factor	Adaptive Attitude	Maladaptive Attitude
(IV) Acceptance versus denial of emotional complexity in child care. Sample item: mothers never worry about what their children will turn into when they grow up.	Acceptance of ambivalent feelings about child care, of some feeling of inadequacy as a mother and of uncertainty regarding some aspects of child care without loss of self-esteem.	Denial of any concerns or doubts regarding child care and of inadequacy in the maternal role, together with highly conventional and stereotyped beliefs and the feeling that mothers require little child care assistance from others.
(V) Feeling of competence versus lack of competence in perceiving and meeting the baby's needs. Sample item: it is a terribly frustrating task to care for a newborn infant because he can't let you know what he needs.	Mothers can understand the infant's physical needs and meet them adequately.	Babies are unable to let others know what their physical needs are and mothers find it very difficult to understand and meet these needs.

* Factor scores are expressed in standardized form based on a larger normative sample, with mean = 0.000 and standard deviation = ±1.000.

° Scores on the first two factors have been reflected so that a positive score indicates more adaptive attitudes.

FROM: Cohler et al., 1980, p. 36

tude factors: appropriate versus inappropriate control of child's aggression; encouragement versus discouragement of reciprocity; appropriate versus denial of emotional complexity in childcare; and feeling of competence versus lack of competence in perceiving and meeting the baby's needs. These factors combine to elicit adaptive maternal attitudes versus maladaptive maternal attitudes toward childrearing.

Demographics. Mothers of both typical and atypical infants completed the Family Data Questionnaire, a paper-and-pencil demographic questionnaire used in similar studies by Gradel (1979) and Thompson (1975). Information used in this study included: infant chronological age and birth order; maternal and paternal chronological age; and maternal and paternal years of education. Levels of educational attainment (e.g., high school, college, graduate degrees) were converted into number of years in order to form an interval scale. Mothers of typical infants and mothers of atypical infants did not differ significantly in age (M 29.07 vs. M 29.67) or in years of education (M 15.2 vs. M 14.0). Similarly, fathers of typical infants and fathers of atypical infants did not differ significantly in age (M 31.47 vs. M 31.40) or in years of education (M 16.2 vs. M 15.3). See Table 4 for dilineation of maternal and paternal ages and levels of education.

Procedure

Within a 2-week period, a trained diagnostician administered the Bayley Scales of Infant Development (Bayley, 1969) to all 30 infants involved in this study. Atypical infants enrolled in the center-based program were evaluated at the center. Atypical infants were tested in their respective homes. The Modified Bayley Interview Instrument (Gradel, 1979) was administered separately to mothers and fathers immediately prior to the infant's evaluation by the diagnostician. This allowed mothers and/or fathers to be present during the infant's assessment. The Carey Temperament Questionnaires (Carey & McDevitt, 1978; Fullard, McDevitt, & Carey, 1978), the Family Data Questionnaire (Gradel, 1979), and the Maternal Attitude Scale (Cohler, 1977) were completed by mothers in a subsequent

Table 4

Means and Standard Deviations on Age and Years of Education for Parent Groups

	Typical (N = 15)		Atypical (N = 15)	
	Age	Education	Age	Education
Mothers	29.07 (3.33)	15.20 (2.21)	29.67 (5.72)	14.00 (3.14)
Fathers	31.47 (3.34)	16.20 (1.74)	31.40 (6.51)	15.27 (4.20)

interview during the 2-week period.

Reliability

Reliability of scoring the Bayley Scales of Infant Development (Bayley, 1969) was assessed by having an observer independently score responses to all items for five typical and five atypical infants during the diagnostic evaluation. Items were rated pass/fail. A tally of item agreement yielded a perfect correlation ($r = 1.00$) between diagnostician evaluation and the observer/s rating for all infants in the reliability sample.

Results

Source of Evaluation

Mental Age (MA) scores were analyzed using a 2 (type) X 3 (source) ANOVA with repeated measures on the last factor. Significant effects for type [$F(1,28) = 10.58$, $p < .003$] and source [$F(1,56) = 8.38$, $p < .007$] were obtained (see Table 5). Post hoc Newman-Keuls was used to determine the means between which significant differences existed. As would be expected, typical infants were significantly older in mental age ($M = 17.1$) than were atypical infants ($M = 9.6$). Verbal predictions of item performance of mothers and fathers yielded equivalent mental ages for their infants ($M = 12.63$ vs. 13.6 respectively), which in turn were significantly lower than that yielded by the diagnostician's evaluation ($M = 14.74$) (see Table 6). No interaction between type and source was obtained, indicating that parents of both typical and atypical infants underestimated infant competence. The average underestimation was 2.1 months.

Correlations bewtween parental and estimations and evaluations by the diagnostician indicated that all three sources of evaluation agreed on the relative order of infants by mental age. The correlation between mother and diagnostician was .97 ($p < .01$) for typical infants and .81 ($p < .01$) for atypical infants. The correlation between father and diagnostician was .93 ($p < .01$) for typical infants and .94 ($p < .01$) for atypical infants. Reports by mothers and fathers yielded a correlation of .94 ($p < .01$) for typical infants and .74 ($p < .01$) for atypical infants.

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Table 5

Summary Table for Type X Source ANOVA on Mental Age

Source	df	MS	F	p
Type (T)	1	1278.47	10.53	.003
Error	28	120.82		
Source (S)	2	44.80	8.38	.0007
S X T	2	2.60	.49	.62
Error	56	5.35		

Table 6

Means and Standard Deviations for
Type X Source ANOVA on Mental Age in Months

Source	Type		Total Sample
	Typical (N = 15)	Atypical (N = 15)	
Mother	16.66 (6.94)	8.60 (6.92)	12.63 (6.93)
Father	16.07 (6.61)	9.17 (7.28)	12.62 (6.95)
Diagnostician	18.57 (5.64)	10.91 (6.21)	14.74 (5.93)
All Sources	17.1 (6.40)	9.6 (6.80)	

Infant Temperament

To assess the influence of infant temperament on parental perceptions of developmental competencies, it was necessary to collapse the four categories into two categories. This was necessary because two of the cells in the Type X Temperament X Source ANOVA contained only one subject, further analysis using the four temperament categories was not computed. Data from the four temperament categories were collapsed into two categories and reanalyzed. Data from "intermediate low" infants were pooled with those infants in the "easy" category, and data from inter-mediate high infants were pooled with those infants in the "difficult" category. Analysis of mental age scores using a 2 (type) X 2 (temperament) X 3 (source) analysis of variance with repeated measures on the last factor yeild significant main effects for type [F (1,26) = 6.99, $p < .01$] and source [F (2,52) = 5.44, $p < .01$]. However, there were no significant temperament effects [F (1,26) = .01, $p < .92$] or interactions (see Table 7). Post hoc Newman-Keuls was used to determine the means between which significant differences existed. It was found that mothers and fathers yielded equivalent mental ages for their infants (M 12.62 vs. 12.62, respectively), which in turn were significantly lower than that yielded by the diagnostician's evaluation (M = 14.74) see Table 8). Although there was a significant effect for type (typical, atypical), the post hoc Newman-Keuls did not determine that significant differences existed between these means. This is probably due to the very large error variance.

Maternal Attitude

To determine "adaptive" and maladaptive" attitudes toward childrearing, each mother was administered the Cohler Maternal Attitude Scale which contains five factors. A one-way ANOVA was used to ascertain the difference between mothers of typical and atypical infants on the five factors. No difference in maternal attitude was found for the two groups of mothers. Results of one-way ANOVAs indicated that groups differed significantly on only one factor, "Appropriate versus Inappropriate Closeness with the Child" (Factor III). Mothers of atypical infants were significantly more inappropriate in this childrearing attitude than were mothers of typical

Table 7

Summary Table for Type X Temperament X Source ANOVA on Mental Age Using Two Categories of Temperament*

Source	df	MS	F	p
Type	1	900.33	6.99	.01
Temperament	1	1.18	.01	.92
Type X Temperament	1	12.21	.09	.76
Error	26	129.64		
Source	2	30.09	5.44	.01
Source X Type	2	2.04	.37	.69
Source X Temperament	2	3.26	.59	.56
Source X Type X Temperament	2	1.64	.29	.74
Error	52	5.54		

* Easy plus Intermediate-Low; Intermediate-High plus Difficult

Table 8

Means and Standard Deviations for Type X Temperament X Source ANOVA on Mental Ages Using Two Categories of Temperament

	Typical		Atypical		Total Sample
	Easy-InLo (n = 12)	InHi-Diff (n = 3)	Easy-InLo (n = 8)	InHi-Diff (n = 7)	
Mother	16.78 (7.51)	16.17 (5.13)	7.75 (6.40)	9.57 (7.86)	12.63 (6.73)
Father	16.25 (7.07)	15.33 (5.51)	9.38 (7.74)	8.93 (7.33)	12.62 (6.91)
Diagnostician	18.92 (6.01)	17.17 (4.51)	10.75 (6.00)	9.87 (6.92)	14.74 (5.86)
All Sources	16.77 (5.96)		9.58 (7.04)		

Table 9

Summary Table for Type X Temperament X Source ANOVA on Mental Age Difference Scores Using Two Categories of Temperament*

Source	df	MS	F	p
Type	1	.14	.62	.90
New Temperament	1	5.10	.60	.47
Type X New Temperament	1	1.22	.14	.71
Error	26	8.51		
Source	1	.11	.01	.91
Source X Type	1	4.03	.49	.49
Source X New Temperament	1	4.82	.58	.45
Source X Type X New Temperament	1	2.83	.34	.56
Error	26	8.24		

* Easy plus Intermediate-Low; Intermediate-High plus Difficult

Table 10

Means and Standard Deviations for Type X Temperament X Source ANOVA on Mental Age Difference Scores Using Two Categories of Temperament

	Typical		Atypical	
	Easy (n = 12)	Difficult (n = 8)	Easy (n = 8)	Difficult (n = 7)
Mother	-2.13	-1.00	-3.00	-1.53
	(2.16)	(1.00)	(5.35)	(1.97)
Father	-2.67	-1.83	-1.38	-2.17
	(2.77)	(1.15)	(2.19)	(1.43)

infants. This indicates that mothers of typical infants in this sample tended toward more appropriate closeness with their infants. Because no differences were found on the other four factors, it appears that mothers of both typical and atypical infants have relatively adaptive childrearing attitudes.

To determine if mothers with adaptive attitudes toward childrearing (i.e., appropriate control of aggression, encourages reciprocity, appropriate closeness, accepts emotional complexity, and feels competent) would be less inaccurate in their estimates of mental ages than would mothers with maladaptive attitudes (i.e., inappropriate control of aggression, discourages reciprocity, inappropriate closeness, denies emotional complexity, and feels incompetent), scores reflecting the difference in MA between mother and diagnostician were analyzed. These were analyzed for each maternal attitude factor using a one-way ANOVA (see Table 12 for means and F-tests). Significant effects were obtained for only one factor, that of "Emotional Complexity in child Care" [F (1,28) = 4.53, $p < .04$]. This seems to indicate that the mothers in this sample who deny concerns or doubt regarding childcare and deny assistance from others give significantly less accurate estimates of their infant's developmental capabilities than mothers in this sample who are more realistic and accept ambivalent feelings about childcare and have some feelings of inadequacy as a mother. Because no differences were found on the other four factors, it appears that childrearing attitudes did not differentially influence mother's perceptions of their infant's developmental capabilities on four of the five factors of the Cohler Maternal Attitude Scale.

Discussion

This study investigated three areas of interest involved in parental perceptions of developmental capabilities for typical and atypical infants. Each area will be discussed in terms of the findings and the implications for further research.

Sources of Evaluation

The present investigation found that maternal and paternal reports of typical and atypical infants' capabilities yielded significant underestimation of their infants' mental ages when compared to

TABLE 11

Differences in Maternal Attitude for Mothers of Typical and Atypical Infants

Maternal Attitude Factors		Typical (n = 15) Mean	SD	Atypical (n = 15) Mean	SD	F	p
I.	Appropriate Control	.67	.70	.51	.94	1	.60
II.	Encouragement of Reciprocity	.64	.56	.80	.59	1	.51
III.	Appropriate Closeness	.49	.79	-.32	.81	7.69	.01
IV.	Acceptance of Complexity	.71	.84	.53	.64	1	.51
V.	Comfort in Meeting the Needs of the Baby	.21	.88	.35	.72	1	.63

TABLE 12

Maternal Accuracy of Perception as a Function of Maternal Attitude

Maternal Attitude Factors		Adaptive n	Mean	SD	Maladaptive n	Mean	SD	F	p
I.	Appropriate Control	8	-1.85	2.89	22	-2.81	3.92	1	.47
II.	Encouragement of Reciprocity	5	-1.71	2.79	25	-4.10	4.45	2.51	.13
III.	Appropriate Closeness	18	-2.67	3.88	12	-1.27	1.33	1.45	.24
IV.	Acceptance of Complexity	25	-1.59	2.78	5	-4.70	3.96	4.53	.04
V.	Comfort in Meeting the Needs of the Baby	20	-2.70	3.70	10	- .95	.97	2.10	.16

diagnostic evaluation. This finding contradicts previous reports of maternal over-estimation for both typical and atypical infants and preschoolers (Blacher-Dixon & Simeonsson, 1981; Gradel, Thompson & Sheehan, 1981; Hunt & Paraskevopoulos 1981). Parents in this study underestimated their infants' competencies by an average of 2 months in mental age. The effect of such underestimation on parents' interactions with their infants has yet to be determined, but Hunt and Parskevopoulos (1981) have argued that "it is not the underestimations but the overestimations that interfere with mothers providing development fostering experiences for their young." Hence, parents who slightly underestimate their infant's level of functioning may be able to provide experiences more closely matching their infant's accomodative or coping capacities than can parents who consistently overestimate them.

Underestimation in this study may have been a "conservative response, possibly based on the educational level of the parents. In the Gradel, Thompson, and Sheehan (1981) study, the mothers of the atypical infants with an average of 9.8 years of education have tended to over-estimate the capabilities of their infants, whereas in this study, the mothers of atypical infants had an average of 14.0 years of education and under-estimated their infants. In another study done by Hunt and Paraskevopoulos (1981), it was found that mothers with more education and outside work experience made fewer errors of overestimation and false predictions than mothers with less education and no work experience. Hence, parental education might be a factor to consider when viewing under and overestimation.

Moreover, this researcher suggests that if one purpose of assessment is to develop a comprehensive and specific educational plan which provides the information that is necessary in planning a day-to-day program for the child, then it seems necessary to look at under and overestimation on an individual basis. In program planning, one can determine the items on which parents differ from the diagnostician and discuss an appropriate plan based on mutual agreement.

Parental involvement in such planning was supported by a second finding in this study which was the high degree of correspondence

between mothers', fathers', and diagnosticians' ratings of developmental capabilities. This was indicated by large, significant correlations bewtween resulting mental ages. The MA scores from typical and atypical infants rank ordered in congruence with the diagnostician. This finding is consistent with similar studies reporting moderate to high correlations (40 to .90) between mothers and professionals (Blacher-Dixon & Simeonsson, 1981; Field, Halock, Dempsey, & Shuman, 1978; Gradel, Thompson, & Sheehan, 1981), and indicates, in addition, that fathers are consistent with diagnosticians. Hence, this researcher suggests that fathers should no longer be the "forgotten contributors to child development" (Lamb, 1975) but should instead be considered equally with mothers in studies of child development.

Because of correlations of .80 or greater between two raters are considered to have met the criterion for reliability, one can conclude that although the parents in this sample tended to underestimate their infant's developmental level, they appear to be reliable estimators of infant competence. Hence, parents may be able to contribute valuable information about their infants as part of an interdisciplinary team. For example, following standardized assessment, parents can provide feedback regarding the consistency of their infant's behavior on failed items. Such feedback would assit in determining program objectives.

Infant Temperament

The second area of interest investigated in this study was to determine if infant temperament differentially influenced parental perceptions of their infant's capabilities. It was found that infant temperament did not differentially influence parental perceptions of their infant's competencies. Maternal and paternal underestimations were equivalent for typical and atypical infants across the categories of easy, intermediate low, intermediate high, and difficult temperament.

Because of the small number of infants obtained in this study for some of the temperament categories, the data from the four categories were collapsed into two. Data from "intermediate low" were pooled with those of infants in the "easy" category, and data from

"intermediate high" were pooled with those of infants in the "difficult" category. Again, maternal and paternal underestimations were equivalent for both typical and atypical infants, and did not differ by "easy" or "difficult" temperament category. Even with the pooled data, these results are tentative because of the small number of infants in each of the temperament categories.

As was indicated previously, the parents in this sample were relatively well-educated. This might account for a more "tolerant" appraisal of their infant's temperament. Hence, in the initial analysis, with the four temperament categories, there was only one atypical and only two typical infants in the "difficult" category. The small number in this sample implies that if infant temperament does in fact differentially influence parental perceptions of infant capabilities, then a study using a larger number of infants in each temperament category needs to be investigated.

Maternal Attitude

Maternal attitude was the final area of interest included in this investigation of parental perceptions of the developmental capabilities of typical and atypical infants. Five factors of maternal attitude were analyzed.

In this sample, mothers of atypical infants differed significantly from mothers of typical infants on one factor of maternal attitude. This factor was labeled "Appropriate Versus Inappropriate Closeness with the Child" (Factor III). Hence, mothers of atypical infants appeared to show more inappropriate closeness with their infants than did mothers of typical infants.

Mothers with an adaptive attitude on this factor (III) appear to be able to enjoy and care for a baby without sacrificing themselves or becoming overly protective. Further, the "adaptive" mother does not seem to yield to the baby's demands for an exclusive relationship.

In this sample, mothers who tended toward a "maladaptive" maternal attitude on the factor (III) appear to see pregnancy, delivery, and childcare as burdensome, depleting, and destructive of self. In addition, the "maladaptive" attitude has the mother vacillating between the wish to be sole caretaker and the wish to

perpetuate the mother-infant symbiosis, and the opposite wish to relegate all aspects of childcare to others.

It would seem almost counterintuitive to imagine mothers of atypical infants not being "maladaptive" on this factor. Pregnancy and delivery, in retrospect, and the present childcare of an atypical infant are probably burdensome and depleting, which would tend to lead to the destruction of one's self-image. The need to be sole caretaker one moment and the wish to relegate all aspects of childcare to others the next moment certainly would seem to be "normal" for mothers of atypical infants.

This researcher finds it most remarkable that mothers of atypical infants were considered "maladaptive" on only this one factor. Once again, this may be attributed to this sample of mothers who were relatively well-educated and who may have more "coping" skills than mothers with less education. Both mothers of typical and atypical infants appear to have relatively "adaptive" childrearing attitudes.

Maternal attitude factors were also analyzed to determine if childrearing attitudes differentially influenced mothers' perceptions of their infant's developmental capabilities. Only one factor was found to differentially influence mothers' perceptions of their infants' capabilities. This factor was labeled "Acceptance versus Denial of Emotional Complexity in Child Care (Factor IV). Mothers in this sample who were considered "maladaptive" on this factor gave significantly less accurate estimates of their infant's developmental capabilities than did mothers with more "adaptive" childrearing attitudes.

"Adaptive" mothers on this factor (IV) are those who tend to accept ambivalent feelings about childcare. These mothers have some feelings of inadequacy as a mother and some uncertainty regarding some aspects of childcare. These feelings are held without any loss of self-esteem.

"Maladaptive" maternal attitudes on this factor indicate that the mother tends to deny concerns or doubts regarding childcare. This mother also denies inadequacy in the maternal role. She is seen as having highly conventional and stereotypic beliefs and feelings

that mothers require little childcare assistance from others.

Hence, it would appear that mothers who are less realistic, who tend to deny concerns and doubts about children, and who feel "perfectly" adequate in the maternal role, are likely to give less accurate estimates of their infant's capabilities than do mothers who are more realistic about their inadequacies in the maternal role. On all other factors (I, II, III, and V) there were no significant differences in degree of underestimation of maternal perceptions of their infants' developmental capabilities.

Limitations of This Study

Several factors in this study limit the study's generalizability. Mothers and fathers of typical and atypical infants underestimated their infants' developmental capabilities compared to the diagnostic evaluation. These underestimations, or more "conservative" estimations, may be attributed to this sample of relatively well-educated parents. Further, parental age may have influenced these findings.

The atypical infants in this study may have been more severely involved than atypical infants in previous studies. The severity of an infant's problems may tend to influence parental perceptions of developmental capabilities. Hence, for parents of typical infants, educational level may account for the more "conservative" estimations. For atypical infants, parent educational level and/or severity of infant handicap may account for parental underestimation.

The expertise of the diagnostician and her ability to elicit the maximum performance from each infant may have influenced the results. This may be a factor to consider in further studies.

The small sample size limited the number of infants in each temperament category. The nonsignificant findings for temperament may be attributed to these small numbers.

In a like manner, maternal attitude findings are based on a very small sample. Although it appears that one factor may be influencing the degree of maternal underestimation, and that one factor may differentiate mothers of typical and atypical infants, these findings are tenuous at best.

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